

# **EXHIBIT E**

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ANDREA M. IGNACIO, CSR, RPR, CRR, CCRR, CLR  
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1

00:32 1 appearances.

00:32 2 MR. WONG: Ryan Wong from Keker Van Nest for  
00:32 3 defendant Real Networks.

00:32 4 MR. PAK: Sean Pak of Quinn Emanuel  
00:32 5 representing Cisco and the witness.

00:32 6 THE VIDEOGRAPHER: Thank you.

00:32 7 If the court reporter would please swear the  
00:32 8 witness, we can begin.

9

10 TONG LIU,  
11 having been sworn as a witness,  
12 by the Certified Shorthand Reporter,  
13 testified as follows:

14

15 EXAMINATION

16 BY MR. WONG:

00:33 17 Q Good morning, Ms. Liu.

00:33 18 A **Good morning.**

00:33 19 Q Please state your full name for the record.

00:33 20 A **Tong Liu.**

00:33 21 Q Do you go by any other names, Ms. Liu?

00:33 22 A **At work I go with Toni.**

00:33 23 Q Could you spell Toni for me, please?

00:33 24 A **T-O-N-I.**

00:33 25 Q Okay. Have you gone by Toni Liu for what

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1 PALO ALTO, CALIFORNIA

00:00 2 FRIDAY, JANUARY 15, 2016

00:00 3 9:32 a.m.

00:00 4

00:00 5

00:00 6 THE VIDEOGRAPHER: Good morning. We are on  
00:31 7 the record at 9:32 on January 15th of the year 2016.

00:31 8 This is the video deposition of Tong Liu. My name is

00:31 9 Kevin Foor. I'm here with court reporter Andrea

00:31 10 Ignacio, and we're here from Veritext Legal Solutions

00:31 11 at the request of Keker Van Nest.

00:31 12 This deposition is being held at Wilson

00:31 13 Sonsini Goodrich & Rosati in Palo Alto.

00:31 14 The caption of the case is Cisco Systems,

00:31 15 Inc., v Arista Networks. That is case 514-CV-05344

00:32 16 ELF BSG.

00:32 17 Please note that audio and video recording

00:32 18 will take place unless all party the agree to go off

00:32 19 the record. Microphones are sensitive and may pick up

00:32 20 whisper, private conversations and cell interference.

00:32 21 I'm not related to any party in this action,

00:32 22 nor am I interested financially in the outcome in any

00:32 23 way. If there are any objections to proceeding,

00:32 24 please state them at the time of your appearance.

00:32 25 And if you would please state your

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00:33 1 period of time have you gone by Toni Liu?

00:33 2 A **That name is only used at work. It's not an**  
00:33 3 **officially alternative name.**

00:33 4 Q And besides Toni Liu have you gone by any  
00:33 5 other names, Ms. Liu?

00:33 6 A **No.**

00:33 7 Q Could you please state your home address?

00:33 8 A [REDACTED]

00:33 9 Q And do you have any personal e-mail addresses  
00:33 10 that you use?

00:33 11 A **Yes.**

00:33 12 Q Could you please tell me what those are?

00:33 13 A [REDACTED].

00:34 14 Q Okay. Any other e-mails addresses?

00:34 15 A [REDACTED].

00:34 16 Q Who is your current employer, Ms. Liu?

00:34 17 A [REDACTED].

00:34 18 Q Do you have a work address for Aruba  
00:34 19 Networks?

00:34 20 A [REDACTED].

00:34 21 Q Do you have an e-mail work address for your  
00:34 22 job at Aruba?

00:34 23 A [REDACTED].

00:34 24 Q Now, Ms. Liu are you represented by counsel  
00:34 25 at this deposition?

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03:06 1 Q I see.

03:06 2 So you read the -- and by the spec you mean

03:06 3 the IEEE PTP spec

03:06 4 A Yes.

03:06 5 Q During the break, the court reporter marked

03:06 6 as Exhibit No. 93 the document right there to your

03:06 7 right, and counsel here's a copy for you as well.

03:06 8 MR. PAK: Thanks.

03:06 9 MR. WONG: The document bears control numbers

03:07 10 Arista NDCA00031733 to '32021.

03:07 11 Q Ms. Liu, you can take your time to look at

03:07 12 the document, but the question that I have for you is

03:07 13 do you recognize this document marked as Exhibit 93?

03:07 14 A Yes, I -- think is the one we used, as well

03:08 15 as the standard.

03:08 16 Q Okay. Can you read the title of the IEEE

03:08 17 specification marked as Exhibit 93?

03:08 18 A IEEE standard for the precision clock

03:08 19 synchronization protocol for network measurement and

03:08 20 control systems.

03:08 21 Q And the -- the -- I guess the number for the

03:08 22 standard on the bottom right is IEEE standard

03:08 23 1588-2008; do you see that?

03:08 24 A Yes, uh-huh.

03:08 25 Q And this is the PTP IEEE standard that we

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03:08 1 have been talking about in this deposition; correct?

03:08 2 A Yes.

03:08 3 Q Okay. So -- so the exhibit marked as 93 is

03:08 4 the standard that you reviewed before you began coding

03:08 5 the PTP functionality for the Cisco industrial

03:08 6 Ethernet device; correct?

03:08 7 A Yes.

03:08 8 Q Okay. And did you read the entire standard

03:09 9 before you began working on the PTP functionality?

03:09 10 A Yeah, I believe I read the -- the entire or

03:09 11 the majority of part of it.

03:09 12 Q That's -- that's impressive.

03:09 13 How -- the standard is -- is several hundred

03:09 14 pages long, but you read the whole thing? You

03:09 15 remember reading the whole thing

03:09 16 A Yes.

03:09 17 Q Did you consult with the standard marked as

03:09 18 Exhibit 93 while you were coding the PTP functionality

03:09 19 for Cisco's industrial Ethernet devices?

03:09 20 A Yes, all of the messages format, the field

03:09 21 definitions behaviors are documented here.

03:09 22 Q Okay. So -- so every PTP functionality --

03:09 23 every aspect of PTP functionality that you implemented

03:10 24 in Cisco's industrial ethernet devices are based on

03:10 25 the IEEE standard marked as Exhibit 93?

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03:10 1 MR. PAK: Objection; mischaracterizes the

03:10 2 witness's testimony.

03:10 3 MR. WONG: Q. Correct?

03:10 4 MR. PAK: Assumes facts not in evidence.

03:10 5 THE WITNESS: There are multiple parts of it

03:10 6 for the implementation part. There is the protocol

03:10 7 part which are the messages, the state machine, the

03:10 8 field definitions. Those we base of the spec. There

03:10 9 are the way we calculate the clock difference. Those

03:10 10 are not documented here. Those are what we developed

03:10 11 and there's also the CLI command which we came up with

03:10 12 separately.

03:10 13 MR. WONG: Q. When you say messages, what do

03:11 14 you mean by messages?

03:11 15 A So the PTP protocol has, if I recall, has

03:11 16 multiple set -- is a handshaking message. So the

03:11 17 format of the message which one follows what, which

03:11 18 field is contained in which message, those are the

03:11 19 find in the spec.

03:11 20 Q Okay. When you follow those definitions when

03:11 21 you implemented the PTP functionality in Cisco's

03:11 22 industrial Ethernet devices; right?

03:11 23 A Yes, the format of the messages.

03:11 24 Q Okay. You also mentioned field definitions.

03:11 25 What do you mean by field definitions?

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03:11 1 A Those are inside of the message itself.

03:11 2 Q Okay. What are fields?

03:11 3 A Like header, checksum. There are time stamps

03:11 4 inside of the message and how big -- how wide the

03:12 5 field is. So those, those are the field definitions

03:12 6 which have specific meaning inside of the message.

03:12 7 Q And those are specified in the IEEE PTP

03:12 8 standard; right?

03:12 9 A Yes.

03:12 10 Q And you followed those standards when

03:12 11 implementing the PTP functionality in Cisco's

03:12 12 industrial Ethernet products; right?

03:12 13 MR. PAK: Objection; available.

03:12 14 THE WITNESS: For the messages, yes.

03:12 15 MR. WONG: Q. And for the field definitions

03:12 16 as well?

03:12 17 A The field definition -- if you mean the --

03:12 18 how wide the field is, which field needs to follow

03:12 19 which one, yes. But particularly on the name of the

03:12 20 field, that may not necessarily be the same as the

03:12 21 spec.

03:12 22 Q Okay. Did you have any role in developing

03:12 23 the PTP standard marked as Exhibit 93?

03:13 24 A You mean contributing to the standard itself.

03:13 25 Q Yes.

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03:19 1 right?

03:19 2 **A Right.**

03:19 3 **Q** And these are acronyms and abbreviations that

03:19 4 are used in the PTP IEEE standard; correct?

03:19 5 **A Yes.**

03:19 6 **Q** And on the following page, page 8, there is

03:20 7 an acronym PTP there; do you see that?

03:20 8 **A Yes.**

03:20 9 **Q** It stands for precision time protocol?

03:20 10 **A Yes.**

03:20 11 **Q** So it was well-known that PTP meant precision

03:20 12 time protocol; correct?

03:20 13 MR. PAK: Objection; calls for speculation

03:20 14 assumes facts not in evidence; calls for expert

03:20 15 testimony.

03:20 16 THE WITNESS: When you say well-known, is

03:20 17 it -- what's the scope of well known?

03:20 18 MR. WONG: It was well known by people in the

03:20 19 networking industry; right?

03:20 20 MR. PAK: Same.

03:20 21 MR. WONG: That PTP meant precision time

03:20 22 protocol?

03:20 23 MR. PAK: Same objections.

03:20 24 THE WITNESS: I don't think it's well known

03:20 25 in the entire networking industry.

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03:20 1 MR. WONG: Okay.

03:20 2 **Q** Was there a subset of the networking industry

03:20 3 where PTP was known to refer to the PTP in Exhibit 93?

03:20 4 MR. PAK: Objection; vague; calls for

03:20 5 speculation; assumes facts not in evidence.

03:20 6 THE WITNESS: It's not as normal a term as IP

03:21 7 or MAC. The -- the term is still, I think, even for

03:21 8 people who are working on the Catalyst switches. It's

03:21 9 not a very well known term.

03:21 10 MR. WONG: Okay.

03:21 11 **Q** But certainly the IEEE standard marked as

03:21 12 Exhibit 93 defines the PTP acronym; correct?

03:21 13 **A Yes.**

03:21 14 **Q** And uses the PTP acronym?

03:21 15 **A Yes.**

03:21 16 **Q** To describe precision time protocol; correct?

03:21 17 **A True.**

03:21 18 **Q** And it uses that PTP acronym to describe the

03:21 19 PTP functionality that you implemented in Cisco's

03:21 20 industrial Ethernet devices; right?

03:21 21 MR. PAK: Objection; assumes facts not in

03:21 22 evidence; mischaracterizes the witness's prior

03:21 23 testimony.

03:21 24 THE WITNESS: In this spec, yes.

03:21 25 MR. WONG: Well, is PTP used in Cisco's

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03:22 1 industrial Ethernet device in a different way than

03:22 2 what PTP means in Exhibit 93?

03:22 3 MR. PAK: Objection; vague.

03:22 4 MR. WONG: Let me rephrase the question.

03:22 5 **Q** In the five commands that you're associated

03:22 6 with in Exhibit 92

03:22 7 **A Right.**

03:22 8 **Q** -- all of them use the acronym PTP; correct?

03:22 9 **A Yes.**

03:22 10 **Q** That PTP refers to the same PTP that is same

03:22 11 shown on page 8 of Exhibit 93; right?

03:22 12 MR. PAK: Objection; vague.

03:22 13 THE WITNESS: I think when I chose the

03:22 14 command, yes. I used PTP to mean the same as

03:22 15 precision time protocol.

03:22 16 MR. WONG: Right. As in the spec.

03:22 17 **Q** As in the spec. And in fact as is object

03:23 18 Feige Exhibit 93 which lists PTP -- which lists PTP as

03:23 19 an acronym; correct?

03:23 20 MR. PAK: Objection; vague.

03:23 21 THE WITNESS: I would is say the meanings are

03:23 22 the same, that they mean precision time protocol.

03:23 23 MR. WONG: Well, the word are the same too,

03:23 24 PTP in the command is the same three letter that is

03:23 25 appear on page 8 of Exhibit 93; correct?

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03:23 1 THE WITNESS: It's the same acronym.

03:23 2 **Q** And they're referring to the same protocol;

03:23 3 correct?

03:23 4 **A Yes.**

03:23 5 **Q** Now, in the turn to page 4 of Exhibit 93?

03:23 6 **A Okay.**

03:23 7 **Q** You can taken off the -- well?

03:24 8 **A This is.**

03:24 9 **Q** Maybe you want to keep that together,

03:24 10 actually.

03:24 11 **A Right.**

03:24 12 **Q** On page 4 of exhibit 93 there's a large

03:24 13 heading number three entitled "definitions, acronyms

03:24 14 and abbreviations"; do you see that?

03:24 15 **A Yes.**

03:24 16 **Q** And in subsection 3.1 says Definitions; do

03:24 17 you see that?

03:24 18 **A Yes.**

03:24 19 **Q** Definition 3.1.4 in the IEEE PTP

03:24 20 specification defines the term clock; do you see that?

03:24 21 **A Yes, uh-huh.**

03:24 22 **Q** What is the definition of clock in the IEEE

03:24 23 standard?

03:24 24 **A It's no participating in the precision time**

03:24 25 **protocol. PTP that is capable of providing a**

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03:56 1 you're talking about now, you didn't work on  
 03:56 2 developing that; correct?  
 03:56 3 **A No, I didn't.**  
 03:56 4 **Q** That -- that existed at the time you proposed  
 03:56 5 adding these PTP commands to Cisco's routing software;  
 03:56 6 correct?  
 03:56 7 **A Yes.**  
 03:56 8 **Q** And if you look briefly at Exhibit 96, let me  
 03:56 9 know when you're there?  
 03:57 10 **A Yes.**  
 03:57 11 **Q** Under interface level config commands, listed  
 03:57 12 there is PTP sync interval with a hyphen; do you see  
 03:57 13 that?  
 03:57 14 **A PTP sync interval, yes.**  
 03:57 15 **Q** With a hyphen?  
 03:57 16 **A With a hyphen.**  
 03:57 17 **Q** Doing a sync interval?  
 03:57 18 **A Right.**  
 03:57 19 **Q** Did you remove the hyphen based upon Mr.  
 03:57 20 Woodman's directive?  
 03:57 21 **A Yes, I believe that should be true.**  
 03:57 22 **Q** And the purpose of removing the hyphen as  
 03:57 23 described in Mr. Woodman's e-mail marked as Exhibit 97  
 03:57 24 was to take advantage of the auto complete  
 03:57 25 functionality; correct?

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03:57 1 MR. PAK: Objection; mischaracterizes the  
 03:57 2 witness's testimony; incomplete.  
 03:57 3 THE WITNESS: I would same both, auto  
 03:57 4 completion and hierarchy.  
 03:57 5 MR. WONG: Q. What --  
 03:57 6 **A As --**  
 03:57 7 **Q** Go ahead.  
 03:57 8 **A You go ahead first.**  
 03:57 9 **Q** What -- in your mind, what is the difference  
 03:57 10 between auto completion functionality and hierarchy?  
 03:58 11 **A Hierarchy, let's say there is PTP sync**  
 03:58 12 **interval. PTP limit. So when you type PTP sync and**  
 03:58 13 **then question mark that gives you you the next level**  
 03:58 14 **of that command which is interval. So this is**  
 03:58 15 **hierarchy part which won't be there if there's a**  
 03:58 16 **hyphen.**  
 03:58 17 So all of them would be under PTP and you  
 03:58 18 have all of the options.  
 03:58 19 **Q** Did you come up with the idea to have a  
 03:58 20 hierarchy for these PTP commands?  
 03:58 21 MR. PAK: Objection; vague.  
 03:58 22 THE WITNESS: Meaning can you rephrase that?  
 03:58 23 Did I come up with the concept?  
 03:58 24 MR. WONG: You just described the concept of  
 03:58 25 a hierarchy. Was that concept -- did that concept

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03:58 1 originate from you?  
 03:58 2 MR. PAK: Objection; vague.  
 03:59 3 THE WITNESS: A lot of Cisco CLI commands  
 03:59 4 has -- have hierarchies. That part I knew even before  
 03:59 5 I developed these commands.  
 03:59 6 MR. WONG: Okay.  
 03:59 7 **Q** So the organization of Cisco commands in a  
 03:59 8 hierarchy existed before you started adding PTP  
 03:59 9 commands to the software?  
 03:59 10 **A Yes.**  
 03:59 11 **Q** And you were aware of that?  
 03:59 12 **A I'm -- yeah, I was aware of that.**  
 03:59 13 **Q** Right.  
 03:59 14 So you modeled -- you modeled your commands  
 03:59 15 based upon the hierarchy concept that already existed  
 03:59 16 in Cisco software?  
 03:59 17 MR. PAK: Objection; vague.  
 03:59 18 THE WITNESS: I think I was thinking it would  
 03:59 19 be good to have that part for these CLI commands.  
 03:59 20 MR. WONG: Okay. Okay. I think it's a good  
 04:00 21 time to take a break.  
 04:00 22 THE VIDEOGRAPHER: It is 1:01. We're going  
 04:00 23 off the record.  
 04:00 24 (Lunch break taken at 1:01 p.m.)  
 04:39 25 ---oOo---

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04:39 1 A F T E R N O O N S E S S I O N  
 04:39 2 1:41 p.m.  
 04:39 3  
 04:39 4  
 04:39 5 THE VIDEOGRAPHER: We are back on the record  
 04:40 6 at 1:41.  
 04:40 7 MR. WONG: Q. So, Ms. Liu, before the lunch  
 04:40 8 break, we talked about the five commands that are  
 04:40 9 associated with you in Exhibit 92.  
 04:40 10 **A Yes.**  
 04:40 11 **Q One of the commands is PTP priority 1.**  
 04:40 12 **A Yes.**  
 04:40 13 **Q Do you see that?**  
 04:40 14 **A Uh-huh.**  
 04:40 15 **Q What is the function that the PTP priority 1**  
 04:40 16 **command performs?**  
 04:40 17 **A It configures the priority 1 parameter for**  
 04:40 18 **the PTP clock.**  
 04:40 19 **Q Okay. When you say for the PTP clock, you**  
 04:40 20 **mean PTP as defined by the IEEE standard; right?**  
 04:40 21 **A Yes.**  
 04:40 22 **Q You're not talking about a different PTP**  
 04:40 23 **that's separate from the IEEE standard; right?**  
 04:40 24 **A No.**  
 04:40 25 **Q Okay. And the PTP in the command PTP**

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04:41 1 priority 1 refers to the IEEE standard; correct?

04:41 2 MR. PAK: Objection; vague.

04:41 3 THE WITNESS: It refers to, yeah, PTP.

04:41 4 MR. WONG: It refers to the IEEE PTP standard

04:41 5 that we marked at Exhibit 93; correct?

04:41 6 THE WITNESS: Yes.

04:41 7 Q Okay. And use of the word PTP in all five of

04:41 8 the commands that are associated with you in

04:41 9 Exhibit 92, they all come from the IEEE standard

04:41 10 marked as Exhibit 93; correct?

04:41 11 MR. PAK: Objection; vague; mischaracterizes

04:41 12 the witness's testimony.

04:41 13 THE WITNESS: You mean the PTP --

04:41 14 MR. WONG: Let me ask the question --

04:41 15 A -- word in the command?

04:41 16 Q Yes. Let me ask a clean question.

04:41 17 The use of the word PTP in all five of the

04:41 18 commands that are associated with you in Exhibit 92 --

04:41 19 A Right.

04:41 20 Q -- that word came from the PTP IEEE standard

04:42 21 that was marked as Exhibit 93; correct?

04:42 22 MR. PAK: Same objections.

04:42 23 THE WITNESS: Yes, it means the same.

04:42 24 MR. WONG: Okay.

04:42 25 Q And you -- in describing the function

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04:42 1 performed by the PTP priority 1 command, you testified

04:42 2 that it configures the priority 1 parameter for the

04:42 3 PTP clock; correct?

04:42 4 A Yes.

04:42 5 Q And the priority 1 parameter for the PTP

04:42 6 clock, that's the same priority 1 parameter that we

04:42 7 discussed in Exhibit 93; correct?

04:42 8 A When you say parameter, I think they are a

04:42 9 little different in the CLI and the spec.

04:42 10 Q How are they different?

04:42 11 A The -- in the spec it's the attribute of the

04:42 12 clock, right. When I say parameter, I mean the -- in

04:43 13 the context of the CLI command is a parameter.

04:43 14 Q Oh, I see.

04:43 15 So -- so the word priority 1 in the PTP

04:43 16 priority 1 CLI command is a parameter of the command

04:43 17 A Yes.

04:43 18 Q That's what you mean by --

04:43 19 A Right.

04:43 20 Q -- parameter?

04:43 21 A Right.

04:43 22 Q Okay. Now, does the priority 1 parameter in

04:43 23 the CLI command, PTP priority 1, does that refer to

04:43 24 the priority 1 attribute in the IEEE standard marked

04:43 25 as Exhibit 93?

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04:43 1 MR. PAK: Objection; vague.

04:43 2 THE WITNESS: Yes, I think I chose it for the

04:43 3 intention to mean the priority 1 attribute of the

04:43 4 clock.

04:43 5 MR. WONG: Q. And is your answer the same

04:43 6 for the command PTP priority 2? Is the priority 2

04:43 7 command parameter, does that refer to the priority 2

04:43 8 attribute in the IEEE standard marked as Exhibit 93?

04:44 9 MR. PAK: Same objection.

04:44 10 THE WITNESS: It's referring to the same,

04:44 11 that attribute, yes.

04:44 12 MR. WONG: That attribute in the IEEE

04:44 13 standard. In the IEEE standard, yes.

04:44 14 Q Okay. And the new about the priority 1 and

04:44 15 priority 2 attributes in the IEEE standard before you

04:44 16 started adding the PTP priority 1 and PTP priority 2

04:44 17 commands to the IOS software; correct?

04:44 18 A Yes, I read the spec.

04:44 19 Q And you were aware of those two particular

04:44 20 attributes before you started adding the PTP priority

04:44 21 1 and PTP priority 2 commands to Cisco's routing

04:44 22 software; right?

04:44 23 A Yes.

04:44 24 Q How long did it take you to come up with the

04:44 25 PTP priority 1 command?

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04:44 1 A I don't remember how long it took for me to

04:45 2 come up with the list of CLI commands.

04:45 3 Q Okay. I am just asking about the -- the one

04:45 4 command PTP priority 1.

04:45 5 A Right.

04:45 6 Q Did that take you an hour to come up with

04:45 7 that command?

04:45 8 MR. PAK: Objection; vague.

04:45 9 THE WITNESS: You mean just to decide on the

04:45 10 syntax on the commands?

04:45 11 MR. WONG: On the two words in the command,

04:45 12 that's right.

04:45 13 Q How long did it take you to decide on the two

04:45 14 words PTP priority 1 in that command?

04:45 15 A I don't remember.

04:45 16 Q Did it take you more than a day?

04:45 17 MR. PAK: Objection; vague.

04:45 18 THE WITNESS: Maybe not. I don't recall the

04:45 19 details of -- of this level.

04:45 20 MR. WONG: Okay do you?

04:45 21 THE WITNESS: How long, yeah.

04:45 22 Q Are you done with your answer?

04:45 23 A Right. Yes, I'm done with my answer.

04:45 24 Q Okay. Do you know if it took you just a few

04:45 25 minutes?

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04:51 1 the source code for those five commands associated  
 04:51 2 with you in Exhibit 92?  
 04:51 3 **A No, I wrote all of them.**  
 04:51 4 **Q** The PTP sync interval command --  
 04:51 5 **A Yes.**  
 04:51 6 **Q** -- well, actually just for charity, what  
 04:51 7 function does the PTP priority 2 command perform?  
 04:51 8 **A It configures another parameter which helps**  
 04:51 9 **to determine the -- the clock.**  
 04:51 10 **Q** And that other parameter you're talking about  
 04:52 11 is the priority 2 attribute that is defined by the  
 04:52 12 IEEE standard marked as Exhibit 93; correct?  
 04:52 13 **A Yes.**  
 04:52 14 **Q** Okay. What function does the PTP sync  
 04:52 15 interval command perform?  
 04:52 16 **A It configures how often the clock sync with**  
 04:52 17 **the master.**  
 04:52 18 **Q** And do you recall earlier we were looking at  
 04:52 19 the IEEE standard marked as Exhibit 93 and a term  
 04:52 20 called sync interval in there?  
 04:52 21 **A Right.**  
 04:52 22 **Q** Is the sync interval that the PTP sync  
 04:52 23 interval command refers to the same sync interval that  
 04:52 24 we discussed in Exhibit 93?  
 04:52 25 MR. PAK: Objection; vague.

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04:52 1 THE WITNESS: I think that was -- this  
 04:52 2 command was used, was defined to be used to configure  
 04:52 3 that part of the clock.  
 04:52 4 MR. WONG: Right.  
 04:52 5 **Q** And by that part of the clock, you mean the  
 04:53 6 sync interval attribute defined by the IEEE PTP  
 04:53 7 standard; right?  
 04:53 8 **A Yes.**  
 04:53 9 **Q** Now, you chose the term priority 1 because  
 04:53 10 priority 1 is an attribute that's in the IEEE  
 04:53 11 standard; right?  
 04:53 12 MR. PAK: Objection; vague.  
 04:53 13 THE WITNESS: You mean when I wrote the  
 04:53 14 command?  
 04:53 15 MR. WONG: When you --  
 04:53 16 THE WITNESS: When I -- when I chose to use  
 04:53 17 priority 1; right?  
 04:53 18 MR. WONG: Yes, that's what I'm asking.  
 04:53 19 THE WITNESS: Yes, when I chose the word, I  
 04:53 20 meant to configure this attribute for the will clock.  
 04:53 21 That was true.  
 04:53 22 MR. WONG: Q. And this attribute for the  
 04:53 23 clock, you're referring to the priority 1 attribute  
 04:53 24 that's defined in the IEEE standard; right.  
 04:54 25 THE WITNESS: Yes.

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04:54 1 **Q** And your answer is the same for the priority  
 04:54 2 2 attribute defined in the IEEE standard, correct,  
 04:54 3 with respect to the PTP priority 2 command?  
 04:54 4 **A Yes.**  
 04:54 5 **Q** And you chose the words sync interval because  
 04:54 6 the IEEE standard marked as Exhibit 93 described --  
 04:54 7 strike that.  
 04:54 8 You chose the words sync interval because the  
 04:54 9 IEEE standard marked as Exhibit 93 also used the word  
 04:54 10 sync interval; correct?  
 04:54 11 MR. PAK: Objection; vague.  
 04:54 12 THE WITNESS: When you say that, it makes me  
 04:54 13 feel that you -- it's a direct translate from the spec  
 04:54 14 to the command. Is that what you mean?  
 04:55 15 MR. WONG: No, no --  
 04:55 16 THE WITNESS: -- when you ask the question?  
 04:55 17 MR. WONG: No, no. My question is simply did  
 04:55 18 you -- you testified that the -- one second.  
 04:55 19 **Q Can you tell me again what the function is**  
 04:55 20 **that the PTP sync interval performs?**  
 04:55 21 **A It configures or determined how often the**  
 04:55 22 **clock sync with the master clock.**  
 04:55 23 **Q** And that functionality is described in the  
 04:55 24 IEEE standard; correct?  
 04:55 25 **A Yes.**

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04:55 1 **Q** And the IEEE standard uses the term sync  
 04:56 2 interval to describe what you just transcribed as the  
 04:56 3 function of the PTP sync interval command; right?  
 04:56 4 MR. PAK: Objection; vague.  
 04:56 5 THE WITNESS: It's the same meaning.  
 04:56 6 MR. WONG: Okay.  
 04:56 7 **Q** So you chose the words sync interval for the  
 04:56 8 PTP sync interval command because the IEEE standard  
 04:56 9 used the same term to describe what the command does;  
 04:56 10 right?  
 04:56 11 MR. PAK: Objection; vague.  
 04:56 12 THE WITNESS: I chose it based on my  
 04:56 13 understanding of the spec and so it's -- it's just a  
 04:56 14 preface of how -- how to express this, how -- how to  
 04:57 15 express this parameter in the -- for the user  
 04:57 16 interface. I wouldn't say it's directly because it's  
 04:57 17 in the spec that's why I use it.  
 04:57 18 MR. WONG: Well, you wouldn't call -- so the  
 04:57 19 IEEE has a priority 1 attribute; right?  
 04:57 20 THE WITNESS: Right.  
 04:57 21 **Q** And it's a requirement of the PTP standard;  
 04:57 22 right?  
 04:57 23 **A Yes.**  
 04:57 24 **Q** Would you call the priority 1 standard  
 04:57 25 priority 2 in a command if the command sets the

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04:57 1 priority 1 attribute?  
 04:57 2 MR. PAK: Objection; vague.  
 04:57 3 THE WITNESS: No I would set it as priority  
 04:57 4 1.  
 04:57 5 MR. WONG: Right.  
 04:57 6 THE WITNESS: Not priority 2.  
 04:57 7 MR. WONG: Q. And that's because you want  
 04:57 8 the command to match the same term that's used in the  
 04:57 9 standard; right?  
 04:57 10 MR. PAK: Objection; mischaracterizes the  
 04:57 11 witness' testimony.  
 04:57 12 MR. WONG: Let me rephrase the question.  
 04:58 13 Q For a command PTP priority 1 that sets an  
 04:58 14 attribute that's called priority 1 in the spec, you  
 04:58 15 should use the same word in the command; correct?  
 04:58 16 MR. PAK: Objection; assumes facts not in  
 04:58 17 evidence.  
 04:58 18 THE WITNESS: No, I don't think that part was  
 04:58 19 true. For example, you could use clock priority 1.  
 04:58 20 Clock priority 2, right. There -- there is no direct  
 04:58 21 association of what I use in the command line CLI that  
 04:58 22 it has to match this spec. That's the -- that -- they  
 04:58 23 are not equal.  
 04:58 24 MR. WONG: Okay.  
 04:58 25 Q Well, priority 1 has a particular meaning in

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04:58 1 the PTP context; correct?  
 04:58 2 A Yes.  
 04:58 3 Q And the PTP priority 1 command performs the  
 04:59 4 function in the PTP context; correct?  
 04:59 5 MR. PAK: Objection; vague; incomplete  
 04:59 6 hypothetical.  
 04:59 7 THE WITNESS: The -- yes, priority attribute  
 04:59 8 is an important part of a PTP clock.  
 04:59 9 MR. WONG: Q. And you chose commands that  
 04:59 10 would be clear to a user trying to set these industry  
 04:59 11 standard attributes; right?  
 04:59 12 MR. PAK: Objection; assumes facts not in  
 04:59 13 evidence; mischaracterizes the witness's testimony.  
 04:59 14 THE WITNESS: I think I chose it based on my  
 04:59 15 understanding of the spec and I don't remember using  
 04:59 16 it because it's in the spec.  
 04:59 17 MR. WONG: But you had reviewed the spec  
 04:59 18 entirely before you started adding these five commands  
 05:00 19 associated with you in Exhibit 92; correct?  
 05:00 20 A I did review the spec, yes.  
 05:00 21 Q So you -- so you were aware that these terms  
 05:00 22 were defined in the IEEE specification marked as  
 05:00 23 Exhibit 93 before you added the five commands  
 05:00 24 associated with you in Exhibit 92; right?  
 05:00 25 MR. PAK: Objection; vague.

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05:00 1 THE WITNESS: When you say the five commands  
 05:00 2 that would include the show command which are  
 05:00 3 different, right, than these configure command?  
 05:00 4 MR. WONG: Sure.  
 05:00 5 Q Why don't we just limit the again then to the  
 05:00 6 three commands we were just talking about PTP priority  
 05:00 7 1?  
 05:00 8 A Right.  
 05:00 9 Q PTP priority 2 and PTP sync interval?  
 05:00 10 A Right.  
 05:00 11 Q You were aware that the terms priority 1,  
 05:00 12 priority 2, SIG interval and PTP were defined in the  
 05:01 13 IEEE specification marked as exhibit 93 before you  
 05:01 14 added those three commands to Cisco's routing  
 05:01 15 software; correct?  
 05:01 16 A I'm aware of those terms being defined in the  
 05:01 17 1588 standard.  
 05:01 18 Q Okay. Before you added those three commands  
 05:01 19 to the Cisco software; correct?  
 05:01 20 A Yes.  
 05:01 21 Q Okay. Now show PTP clock is another command  
 05:01 22 that you're associated with; correct?  
 05:01 23 A Yes.  
 05:01 24 Q What's the function performed by the show PTP  
 05:01 25 clock command?

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05:01 1 A It shows the status of the clock and I don't  
 05:01 2 recall the entire output from the command, but I think  
 05:01 3 that's probably summarize the majority of the output.  
 05:01 4 Q Okay. And as we discussed earlier in today's  
 05:01 5 deposition, the PTP IEEE specification defines the  
 05:02 6 term clock; correct?  
 05:02 7 A It defined the term clock, yes.  
 05:02 8 Q Okay. And the clock that is referred to in  
 05:02 9 the command show PTP clock is the clock that is  
 05:02 10 defined in the PTP standard; correct?  
 05:02 11 MR. PAK: Objection; vague.  
 05:02 12 THE WITNESS: Well, the command shows the PTP  
 05:02 13 clock status.  
 05:02 14 MR. WONG: And you refer to "the PTP clock"  
 05:02 15 in that response you just gave, you're referring to  
 05:02 16 the clock that is defined in the PTP standard;  
 05:02 17 correct?  
 05:02 18 A Yes, it means the clock.  
 05:02 19 Q Now, the -- the word "show" in that command,  
 05:02 20 were there other commands in iOS that used the word  
 05:03 21 "show" before you added this show PTP clock command to  
 05:03 22 the software?  
 05:03 23 A Yes.  
 05:03 24 Q Okay. You were familiar that other commands  
 05:03 25 used the first word of show to display information

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05:03 1 before you added the show PTP clock command; correct?

05:03 2 **A Yes.**

05:03 3 **Q** Okay. So you -- you simply followed what

05:03 4 other commands were doing when you chose the word show

05:03 5 in show PTP clock; is that right?

05:03 6 MR. PAK: Objection; assumes facts not in

05:03 7 evidence; mischaracterizes the witness's testimony.

05:03 8 MR. WONG: If anything that I'm saying --

05:03 9 THE WITNESS: Show.

05:03 10 **Q** Sorry.

05:03 11 **A -- is a big category of commands. Like**

05:03 12 **there's debug, there is config, there is show. So**

05:03 13 **though is one big category of commands.**

05:03 14 **Q** And there was a big -- and that category of

05:03 15 commands, the show commands, existed before you added

05:04 16 the show PTP clock to the command software; correct?

05:04 17 **A Yes.**

05:04 18 **Q** And you were just building upon that category

05:04 19 of commands when you used the word show in show PTP

05:04 20 clock; correct?

05:04 21 MR. PAK: Objection; mischaracterizes the

05:04 22 witness's testimony.

05:04 23 THE WITNESS: Yes, I think that -- that was

05:04 24 the intention.

05:04 25 MR. WONG: Q. And is the same

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05:04 1 explanation -- does the same explanation apply to show

05:04 2 PTP parent for the show aspect of that command.

05:04 3 **A Yes 74 the show aspect of the command, yes.**

05:04 4 **Q** Okay. What function does the show PTP parent

05:04 5 command perform?

05:04 6 **A It shows the status of the parent clock.**

05:04 7 **Q** When you say the parent clock, are you

05:05 8 referring to the parent clock as defined in the PTP

05:05 9 standards?

05:05 10 **A Yes.**

05:05 11 **Q** And you recall discussing the definition of

05:05 12 parent clock in the standards earlier in this

05:05 13 deposition; correct?

05:05 14 **A Yes.**

05:05 15 **Q** And another shorthand used by the IEEE

05:05 16 standard for parent clock is simply parent; correct?

05:05 17 MR. PAK: Objection; vague.

05:05 18 THE WITNESS: Can you refer me to that page.

05:05 19 MR. WONG: Sure. Sure. Absolutely. I think

05:05 20 it's on page 53 of Exhibit 93. It's in that sentence

05:06 21 maybe two-thirds of the way down on page 53 which

05:06 22 starts with ordinary and boundary clocks may keep

05:06 23 statistics.

05:06 24 **A Uh-huh, using the following attribute. Okay.**

05:06 25 **Q** So you would agree that in the IEEE standard,

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05:06 1 it uses the term "parent" as shorthand for parent

05:06 2 clock?

05:06 3 **A Yes.**

05:06 4 **Q** Okay. Do you know if commands that use the

05:06 5 word show were used before they were used in Cisco's

05:06 6 software?

05:06 7 MR. PAK: Objection; calls for expert

05:06 8 testimony.

05:06 9 THE WITNESS: I'm not aware of that.

05:06 10 MR. WONG: Okay. I'm just asking whether you

05:06 11 personally know of. If you don't --

05:06 12 THE WITNESS: No, I don't.

05:06 13 **Q** -- that's fine. What's the next exhibit

05:07 14 number?

05:07 15 THE REPORTER: 98.

05:07 16 MR. WONG: Okay.

05:07 17 (Document marked Exhibit 98

05:07 18 for identification.)

05:07 19 MR. WONG: The court reporter has marked as

05:07 20 Exhibit 98 a document bearing control numbers

05:07 21 CSI-CLI-00194055 to '194800.

05:07 22 **Q** Ms. Liu, do you recognize this document?

05:07 23 **A I don't recognize this document.**

05:07 24 **Q** Okay. Have you seen Cisco command reference

05:07 25 guides before?

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05:07 1 **A In general terms, right, not particular to**

05:08 2 **700 series?**

05:08 3 **Q** That's -- that's correct, in general terms.

05:08 4 **A Yes, I have.**

05:08 5 **Q** Does this appear to be a command reference

05:08 6 guide for the 700 series product based upon what you

05:08 7 have seen in terms of other manuals?

05:08 8 **A I think it's similar.**

05:08 9 **Q** Okay. Just a few questions about this

05:08 10 document.

05:08 11 If turn, please, to page 336. Control number

05:08 12 at the bottom is CSI-CLI-00194418.

05:08 13 **A Okay.**

05:08 14 **Q** Tell in when you're there.

05:08 15 **A Yes.**

05:08 16 **Q** This page of Exhibit 98 at the top says "PTP

05:09 17 priority 1"; correct?

05:09 18 **A Yes.**

05:09 19 **Q** And this -- this page purports to describe

05:09 20 the PTP priority 1 command that we've been talking

05:09 21 about today; correct?

05:09 22 **A Yes.**

05:09 23 **Q** Okay. Did you contribute at all to writing

05:09 24 the wrenches manuals for the commands that you added

05:09 25 to Cisco's routing software?

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05:54 1 MR. KAZI: Same, same objections.  
 05:54 2 THE WITNESS: There are -- there are multiple  
 05:54 3 ways achieving the same goal. It doesn't have to be  
 05:54 4 exactly the same.  
 05:54 5 MR. WONG: Q. Did you have that belief back  
 05:54 6 in 2008?  
 05:54 7 **A Yes, we -- we did config -- we did consider**  
 05:54 8 **multiple options when we came up with -- before we**  
 05:54 9 **finalize on the commands.**  
 05:54 10 **Q** Did you ever file any intellectual property  
 05:54 11 rights disclosures with the IEEE regarding the CLI  
 05:55 12 commands that you added to Cisco's devices in 2008  
 05:55 13 relating to PTP?  
 05:55 14 MR. PAK: Objection; calls for speculation.  
 05:55 15 THE WITNESS: I didn't file any claims.  
 05:55 16 MR. WONG: Q. Are you aware of anyone at  
 05:55 17 Cisco filing any intellectual property rights claims  
 05:55 18 with the IEEE relating to the PTP CLI commands that  
 05:55 19 were added in 2008?  
 05:55 20 MR. PAK: Same, same objections; calls for  
 05:55 21 speculation.  
 05:55 22 THE WITNESS: I myself do not know.  
 05:55 23 MR. WONG: Okay. All right. Well, subject  
 05:55 24 to any questions from your counsel, I have no further  
 05:55 25 questions for you at this time.

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05:55 1 MR. PAK: I do have some questions, so why  
 05:55 2 don't we switch.  
 05:55 3 THE VIDEOGRAPHER: Do you want to stay on?  
 05:55 4 MR. PAK: Yeah.  
 05:55 5 THE VIDEOGRAPHER: Okay. There's a couple of  
 05:56 6 them over there. One there and one there. Stereo.  
 05:56 7 Whatever works for you.  
 05:56 8  
 05:56 9 EXAMINATION  
 05:56 10 BY MR. PAK:  
 05:56 11 **Q** Good afternoon, Ms. Liu.  
 05:56 12 **A Good afternoon.**  
 05:56 13 **Q** Again, for the record this is Sean Pak of  
 05:56 14 Quinn Emanuel.  
 05:56 15 Ms. Liu, before we follow-up on some of the  
 05:57 16 topics that were discussed during your examination,  
 05:57 17 can you tell us whether you're being compensated for  
 05:57 18 your time working on this case or providing this  
 05:57 19 deposition  
 05:57 20 **A No, I was not.**  
 05:57 21 **Q** So you're not receiving any kind of monetary  
 05:57 22 compensation for your involvement in this case through  
 05:57 23 the subpoena; is that correct?  
 05:57 24 **A (Witness nods head.)**  
 05:57 25 **Q** Okay. And again can you verbally indicate

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05:57 1 the answer.  
 05:57 2 **A No, I didn't.**  
 05:57 3 **Q** Okay. And, Ms. Liu, do you have any stake in  
 05:57 4 the outcome of this case whatsoever?  
 05:57 5 **A No.**  
 05:57 6 **Q** Okay. Ms. Liu I want to go back to some of  
 05:57 7 the topics that were covered in your examination.  
 05:57 8 Early on in the day when you were being asked  
 05:57 9 questions by counsel from Arista one of the things you  
 05:57 10 said was that you had come up with the CLI commands  
 05:58 11 separately from the industry standard; do you recall  
 05:58 12 that testimony?  
 05:58 13 MR. WONG: Objection; misstates prior  
 05:58 14 testimony.  
 05:58 15 THE WITNESS: Yes.  
 05:58 16 MR. PAK: Okay.  
 05:58 17 **Q** Can you explain what you meant that CLI  
 05:58 18 commands -- that you had come up with the CLI commands  
 05:58 19 separately?  
 05:58 20 MR. WONG: Objection; misstates prior  
 05:58 21 testimony.  
 05:58 22 THE WITNESS: So I think by separately, I  
 05:58 23 think I mean the protocol and state machine is one  
 05:58 24 part. And after that's all done, we came up with the  
 05:58 25 CLI commands.

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05:58 1 MR. PAK: Q. And you were shown this IEEE  
 05:58 2 standard document, Exhibit No. 94; do you recall that?  
 05:58 3 **A 94. I'm trying to see which one is 94.**  
 05:59 4 **Q** It should be this one here -- oh, actually  
 05:59 5 sorry.  
 05:59 6 MR. WONG: That's right. Oh, I don't know  
 05:59 7 which one.  
 05:59 8 MR. PAK: No, no, I'm sorry. I believe we --  
 05:59 9 you had marked that as.  
 05:59 10 MR. WONG: If you're talking about the big  
 05:59 11 one it's 93 which is the standard.  
 05:59 12 MR. PAK: Yes. So if you look at Exhibit  
 05:59 13 No. 93.  
 05:59 14 THE WITNESS: Yes.  
 05:59 15 **Q** Do you recall that counsel for Arista showed  
 05:59 16 you this exhibit which is an IEEE standard for the  
 05:59 17 precision clock --  
 05:59 18 **A Yes.**  
 05:59 19 **Q** -- synchronization protocol?  
 05:59 20 And you testified earlier that you had  
 05:59 21 reviewed this standard document; correct  
 05:59 22 **A Yes.**  
 05:59 23 **Q** Okay. Ms. Liu, do you know based on your  
 05:59 24 understanding and review of the document as part of  
 05:59 25 your work for Cisco, do you know whether this standard

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05:59 1 requires any particular commands to be used for any of  
 05:59 2 the protocols that are specified?  
 05:59 3 **A When you say command, do you mean the CLI**  
 05:59 4 **command?**  
 05:59 5 **Q Correct.**  
 05:59 6 **A From my understanding, some of the attribute**  
 06:00 7 **attention shall be configureable, but whether it's**  
 06:00 8 **from the CLI command or some other interface, that's**  
 06:00 9 **the part which I think it's an option.**  
 06:00 10 **Q And what are some examples, based on your**  
 06:00 11 **understanding of the specification, what are some**  
 06:00 12 **options that a designer like yourself would have in**  
 06:00 13 **terms of implementing the interface what the user sees**  
 06:00 14 **in terms of the various features specified in the nine**  
 06:00 15 **-- Exhibit 93 IEEE document?**  
 06:00 16 **MR. WONG: Objection; vague.**  
 06:00 17 **THE WITNESS: GUI interface could be one.**  
 06:00 18 **MR. PAK: When you say GUI, what do you mean**  
 06:00 19 **by that?**  
 06:00 20 **THE WITNESS: With like a web interface, drop**  
 06:00 21 **down manuals, common line interface could be one. And**  
 06:01 22 **predefined default or as the spec said some profiles**  
 06:01 23 **could be options as well, I think.**  
 06:01 24 **Q Based on your understanding of the IEEE**  
 06:01 25 **document, can you comply with the standard by using**

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06:01 1 any one of these interfaces for the particular  
 06:01 2 features that are specified in the IEEE document?  
 06:01 3 **MR. WONG: Objection; incomplete**  
 06:01 4 **hypothetical; vague and ambiguous.**  
 06:01 5 **THE WITNESS: I would think the same set of**  
 06:01 6 **attributes and parameters should be able to come from**  
 06:01 7 **a GUI interface.**  
 06:01 8 **MR. PAK: Q. You were also asked by counsel**  
 06:01 9 **some statements from the IEEE document and there was**  
 06:01 10 **testimony that you gave which indicated your**  
 06:02 11 **understanding that for mandatory functionality there**  
 06:02 12 **would be no deviation of the behavior; do you recall**  
 06:02 13 **that testimony?**  
 06:02 14 **A Yes.**  
 06:02 15 **Q Okay. When you said no deviation of the**  
 06:02 16 **behavior, what did you mean by that?**  
 06:02 17 **A That the external feature or functionality of**  
 06:02 18 **the PTP clock should be consistent with the spec, but**  
 06:02 19 **that doesn't imply the CLI part. I think that's what**  
 06:02 20 **I want to say. It's the feature part.**  
 06:02 21 **Q And can you elaborate on that? What do you**  
 06:02 22 **mean when you say it doesn't imply the CLI part in**  
 06:02 23 **your answer?**  
 06:02 24 **A So I think the standard describes how the PTP**  
 06:02 25 **clock functions and that's -- to me that's the feature**

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06:03 1 **part. That's the functionality of the protocol.**  
 06:03 2 As to what are the configureable parameters  
 06:03 3 or attribute of a clock, that was by design and by  
 06:03 4 choice. It's not defined in the -- it's not  
 06:03 5 completely defined in the spec.  
 06:03 6 **Q So let's look at some of the specific**  
 06:03 7 **examples that were given to you. If you look at --**  
 06:03 8 **this is now separate document Exhibit No. 92.**  
 06:03 9 **A Okay.**  
 06:03 10 **Q Do you see on page 24 of that document the**  
 06:03 11 **CLI command PTP priority 1?**  
 06:03 12 **A Yes.**  
 06:03 13 **Q Is it possible to the functionality of PTP**  
 06:04 14 **priority 1 using a different command than the one that**  
 06:04 15 **you selected?**  
 06:04 16 **MR. WONG: Objection; vague and ambiguous.**  
 06:04 17 **THE WITNESS: I can think of maybe PTP clock**  
 06:04 18 **priority 1 or PTP prior one. I think there could be**  
 06:04 19 **different ways of defining the same parameter in the**  
 06:04 20 **slightly different way.**  
 06:04 21 **Q And when counsel was asking you some**  
 06:04 22 **questions towards the end you talked about having the**  
 06:04 23 **ability to use different types of commands for the**  
 06:04 24 **same functionality. Do you recall that testimony?**  
 06:04 25 **A Different types of commands.**

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06:04 1 **Q Or different commands, yes.**  
 06:04 2 **A Different commands, yes.**  
 06:04 3 **Q Okay. And again if you're looking at the PTP**  
 06:04 4 **priority 2 command, is it possible to have different**  
 06:04 5 **commands for the functionality of the PTP priority 2**  
 06:04 6 **based on your understanding of the IEEE specification?**  
 06:05 7 **A Yeah, you could say PTP, saying PTP clock**  
 06:05 8 **priority 2 or priority-two.**  
 06:05 9 **Q And then let's just go through the rest of**  
 06:05 10 **the commands we discussed during your initial**  
 06:05 11 **examination.**  
 06:05 12 **If you turn now to now on page -- actually on**  
 06:05 13 **the same page, page 24, PTP sync interval, yet are**  
 06:05 14 **there different ways of expressing the command for**  
 06:05 15 **that same function of PTP sync interval?**  
 06:05 16 **A Maybe PTP sync-interval, or PTP interval and**  
 06:06 17 **then space sync as there could be multiple different**  
 06:06 18 **types of intervals that you can define with PTP clock.**  
 06:06 19 **Q Let's take that example. If I had PTP sync**  
 06:06 20 **interval which is what you selected and compare that**  
 06:06 21 **to PTP interval sync, based on your experience with**  
 06:06 22 **CLI commands, would those two commands have the same**  
 06:06 23 **command hierarchy or different command hierarchies?**  
 06:06 24 **A You mean, with dash or without dash?**  
 06:06 25 **Q Without dash.**

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06:06 1 **A** It's going to be different depending on  
 06:06 2 whether -- so how you look at, right. If you want to  
 06:06 3 have multiple intervals, then you put interval first  
 06:06 4 and then you have interval sync, interval something  
 06:06 5 else.  
 06:06 6 I think at the time we chose this form was  
 06:06 7 because there were other sync parameters than  
 06:07 8 interval. So we did sync and then under that you can  
 06:07 9 have sub commands of different options to configure.  
 06:07 10 **Q** And the safety example of carrying PTP space  
 06:07 11 sync interval compared to PTP sync-interval, would  
 06:07 12 those two commands have the same hierarchy or  
 06:07 13 different command hierarchies?  
 06:07 14 **A** PTP sync interval would give you one more  
 06:07 15 level of hierarchy while PTP sync-interval is -- this  
 06:07 16 term is on the same level, right. Sync and interval.  
 06:07 17 It's just one key word. So it's different. It's one  
 06:07 18 more level of hierarchy with a space.  
 06:07 19 **Q** So in that example, PTP sync interval, how  
 06:08 20 many levels would you have in the command hierarchy?  
 06:08 21 **A** Three.  
 06:08 22 **Q** And in the other example of PTP  
 06:08 23 sync-interval, how many levels would you have in the  
 06:08 24 command hierarchy?  
 06:08 25 **A** Two.

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06:08 1 **Q** Another topic that was discussed during your  
 06:08 2 examination was Plug Fest; do you recall that?  
 06:08 3 **A** Yes.  
 06:08 4 **Q** Okay. When you were talking about  
 06:08 5 interoperability of vendor products for Plug Fest,  
 06:08 6 what did you mean by that?  
 06:08 7 **A** It's the -- when the vendors support PTP v2,  
 06:08 8 when their devices are connected together they should  
 06:08 9 be able to sync to the same master clock or grand  
 06:08 10 master clock, and they would be able to calculate  
 06:09 11 based on the PTP algorithm to sync the time, calculate  
 06:09 12 delays and all of those. So these are the behavior --  
 06:09 13 behavior-wise. They should all comply to the  
 06:09 14 standard, PTP standard.  
 06:09 15 **Q** Based on your understanding of Plug Fest and  
 06:09 16 the PTP IEEE standard, can you have the type of  
 06:09 17 behavioral interoperability that you talked about  
 06:09 18 while having different types of command interfaces for  
 06:09 19 the different vendor products?  
 06:09 20 **MR. WONG:** Objection; calls for expert  
 06:09 21 testimony.  
 06:09 22 **THE WITNESS:** Yes. How you achieve the  
 06:09 23 configuration of the clock could be very different.  
 06:09 24 The interoperability is on the -- on the behavior, on  
 06:09 25 the features. Not on how you configure the -- the

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06:09 1 device.  
 06:09 2 **MR. PAK:** So.  
 06:09 3 **THE WITNESS:** That's my understanding.  
 06:10 4 **MR. PAK:** So would your Cisco product that  
 06:10 5 used your CLI interface for the PTP commands, would --  
 06:10 6 would that be product be interoperable in a Plug Fest  
 06:10 7 environment with a Siemens product that used a GUI  
 06:10 8 interface G-U-I interface for PTP?  
 06:10 9 **MR. WONG:** Objection; incomplete  
 06:10 10 hypothetical; foundation.  
 06:10 11 **THE WITNESS:** Okay. It would be. It doesn't  
 06:10 12 matter how you configure or reach this state, right.  
 06:10 13 It's the -- it's the clock behavior, the device that  
 06:10 14 are interoperable.  
 06:10 15 **MR. PAK:** Okay.  
 06:10 16 **Q** Just to be clear on the record about your  
 06:10 17 experience in this regard, you worked on the PTP  
 06:10 18 implementation for Cisco; correct?  
 06:10 19 **A** Yes.  
 06:10 20 **Q** You also read the IEEE PTP specification as  
 06:10 21 part of your work for Cisco; correct?  
 06:10 22 **A** Yes.  
 06:10 23 **Q** And your implementation that for the PTP  
 06:10 24 protocol for Cisco was then, to your knowledge, used  
 06:11 25 at Plug Fest?

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06:11 1 **A** Yes.  
 06:11 2 **Q** And in doing that, you understood generally  
 06:11 3 what the requirements of Plug Fest interoperability  
 06:11 4 are; correct?  
 06:11 5 **A** Yes.  
 06:11 6 **MR. WONG:** Objection; leading.  
 06:11 7 **MR. PAK:** Okay.  
 06:11 8 **Q** And what is your understanding of the  
 06:11 9 requirements of Plug Fest interoperability?  
 06:11 10 **A** I don't recall all of the requirement. Our  
 06:11 11 focus at the time was on the clock side that Cisco's  
 06:11 12 \*\*Guy can -- can be selected as master clock and it  
 06:11 13 can sync to master clock if some other vendor's device  
 06:11 14 were selected as master clock. So it's on the -- on  
 06:11 15 the timing and on the clock behavior part.  
 06:11 16 **Q** So why don't you pull out Exhibit No. 93  
 06:12 17 which is again the IEEE standard for the precision  
 06:12 18 clock synchronization protocol.  
 06:12 19 **A** Okay.  
 06:12 20 **Q** Do you recall that counsel showed you some  
 06:12 21 pages from this document; correct?  
 06:12 22 **A** Yes.  
 06:12 23 **Q** Okay. I'm going to show you some additional  
 06:12 24 pages that relate to the questions that he asked.  
 06:12 25 **A** Okay.

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06:31 **1 Q** Are you aware of other e-mails that exist  
 06:31 **2** that list out the various options that you actually  
 06:31 **3** considered for each of these commands?  
 06:31 **4 A I don't remember there would be e-mails with**  
 06:31 **5 the parser police. We only consult them as the very**  
 06:31 **6 last stage.**  
 06:32 **7 Q** Are there any e-mails in your recollection in  
 06:32 **8** general, not just with the parser police, but with  
 06:32 **9** your colleagues on the team that list out the various  
 06:32 **10** options that you actually considered when coming up  
 06:32 **11** with any of these commands listed on Exhibit 96?  
 06:32 **12 A I don't recall that detail.**  
 06:32 **13 Q** Okay. Were there any other documents besides  
 06:32 **14** e-mails where you would have listed out alternatives  
 06:32 **15** that you actually considered back in 2008 when you  
 06:32 **16** were coming up with the commands that are proposed in  
 06:32 **17** Exhibit 96?  
 06:32 **18 A There could be conversations in meetings, but**  
 06:32 **19 as to e-mails, I'm not -- I don't recall the details.**  
 06:32 **20 I don't remember other e-mails.**  
 06:32 **21 Q** Okay. So the only document that we have that  
 06:32 **22** what commands were considered for these PTP functions  
 06:32 **23** is Exhibit 96; correct?  
 06:33 **24 A Yes, these e-mails are the ones as far as I**  
 06:33 **25 can see.**

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1 THE WITNESS: I would -- I'm pretty sure I 06:34  
 2 came with all of these commands. 06:34  
 3 MR. WONG: Okay. 06:34  
 4 THE WITNESS: I was the main developer. 06:34  
 5 MR. WONG: Okay. 06:34  
 6 Q But you don't remember -- 06:34  
 7 A Of all of this. 06:34  
 8 Q I'm sorry. Please finish your answer. 06:34  
 9 A Right. 06:34  
 10 Q But you don't remember whether you spent a 06:34  
 11 day or an hour or five minutes coming up with any of 06:34  
 12 these commands; correct? 06:35  
 13 A Right, I don't remember particular to each 06:35  
 14 command how much time I spent on that. 06:35  
 15 MR. WONG: Okay. I have no further 06:35  
 16 questions. 06:35  
 17 MR. PAK: Again, we'll just mark this as 06:35  
 18 confidential under the protective order and I don't 06:35  
 19 have any further questions. 06:35  
 20 THE VIDEOGRAPHER: All right. This will 06:35  
 21 complete Ms. Lu's deposition consisting of three 06:35  
 22 original discs which will be retained by Veritext. 06:35  
 23 The time is 3:36. We are going off the record. 06:35  
 24 (WHEREUPON, the deposition ended 06:35  
 25 at 3:36 p.m.) 06:35

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06:33 **1 Q** Okay. And you -- did you destroy any  
 06:33 **2** documents while you were at Cisco that might have  
 06:33 **3** contained other alternatives that you considered for  
 06:33 **4** any of the PTP commands that we discussed today?  
 06:33 **5 A No, I wouldn't have.**  
 06:33 **6 Q** Okay. And in preparing for this deposition,  
 06:33 **7** did you see any other documents that showed any  
 06:33 **8** alternatives to any of the PTP commands that are  
 06:33 **9** listed in Exhibit 96?  
 06:33 **10 A In preparation, I only saw these e-mails.**  
 06:33 **11 Q** Okay.  
 06:33 **12 A But, again, I don't recall during the time of**  
 06:34 **13 the few months of development whether there was any**  
 06:34 **14 written record of alternatives. It's -- on my mind**  
 06:34 **15 it's not 100 percent sure there was written record.**  
 06:34 **16 Q** Okay. In fact you're not even sure how long  
 06:34 **17** it took for you to even come up with these commands as  
 06:34 **18** compared to the development; right?  
 06:34 **19 A I don't remember that part.**  
 06:34 **20 Q** Right.  
 06:34 **21 A Of the detail.**  
 06:34 **22 Q** That the part of coming up with these  
 06:34 **23** commands is not as fresh in your memory; correct?  
 06:34 **24 MR. PAK: Objection; mischaracterizes the**  
 06:34 **25** witness's testimony.

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